

Mitosis - cell division.

Karyokinesis - indirect cell division.

Cytology - study of cell division.

Mitosis is continuous. Four stages.

- 1) Prophase
- 2) Metaphase
- 3) Anaphase
- 4) Telophase

First.

Spireme (thread-like structure forms in the nucleus).

- is a single continuous thread, organized from chromatin network.

Second.

Chromosomes - (chromosome theory of heredity)

- segments of the spireme, formed as it divides.
- 46 chromosomes in human body.

Page 23 + 24.

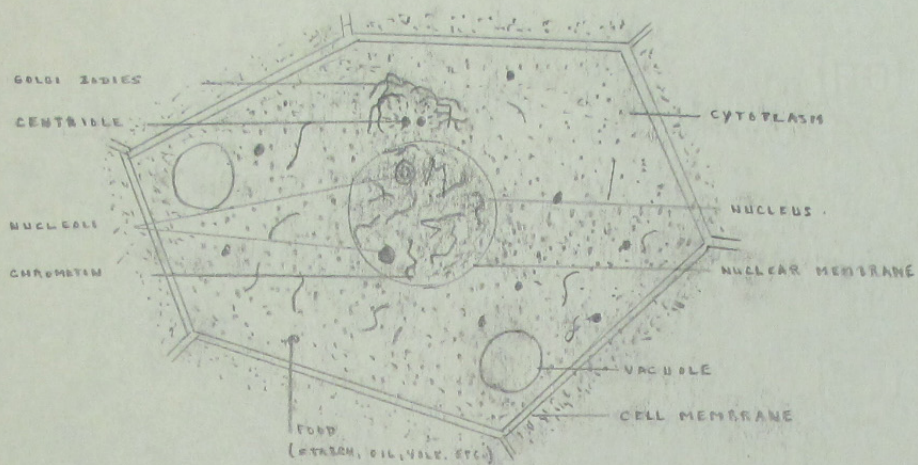
Chromosomes constant in number throughout life of individual in the sex cells.

Spermatogenesis in the male, oogenesis in the female. In man 47, in woman 48.

Embryology - development of animals from time of fertilization to time of birth a long process of cell division.

Male - sex cell from one of two testes.

TYPICAL ANIMAL CELL.



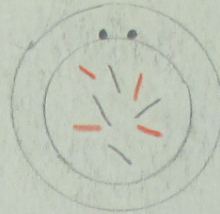
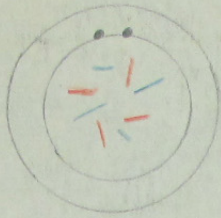
MATURATION DIVISION.

MALE SEX CELL.

FEMALE SEX CELL.

1.

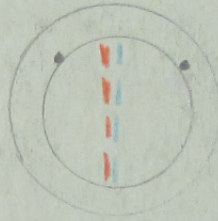
EACH SEX CELL HAS A
DIPLOID NO. OF CHROMOSOMES.
(48)



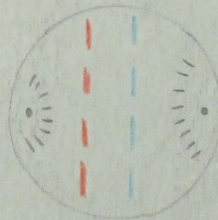
2.

IN MATURATION DIVISION
CHROMOSOMES LINE UP IN 2'S.

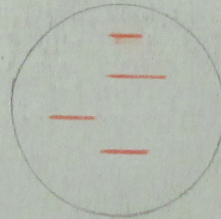
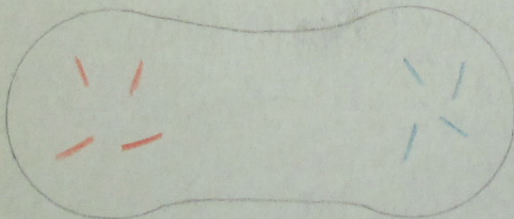
IN MITOTIC DIVISION
CHROMOSOMES LINE UP IN 1'S.



3.



4.



OVUM

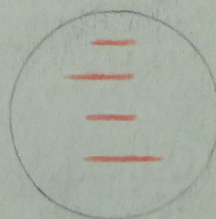
POLAR BODY (DIES)

2 SPERM TO EACH CELL.

5.



SPERMS



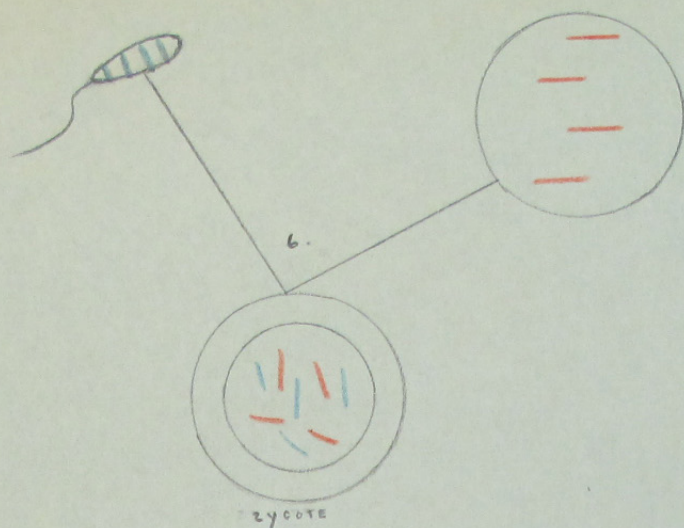
OVUM

EACH SPERM HAVE A HAPLOID NO. OF CHROMOSOMES. (24)
SPERM TRAVELS 1CM. IN $\frac{1}{2}$ MINUTE.

EACH OVUM HAS A HAPLOID NO. OF
CHROMOSOMES. (24)

Maturation & Reduction Division

1. Ordinary sex cells.
2. Centrioles move along nuclear wall, chromosomes develop from sperme.
3. Cell wall disappears. Centrioles surrounded by spindles, which draw chromosomes to the side of the cell, the chromosomes having lined up in 2's.
4. Centrioles disappear.
male - formation of the sperms commence
female - two cells produced, the ovum & the polar body.
5. Male - two sperms produced, each containing the same number of chromosomes (4 in this case)
Female - the polar body dies, leaving the ovum, containing (4 chromosomes in this case)
6. Zygote produced by union of male sperm and female ovum.
Mitotic division until individual is completely developed.



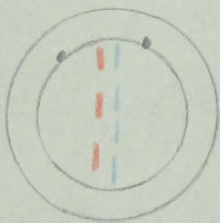
MITOTIC DIVISION TILL INDIVIDUAL IS COMPLETELY DEVELOPED.

THEORY OF 47 CHROMOSOMES IN MALE SEX CELL.

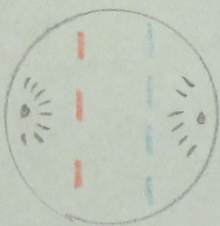
1.



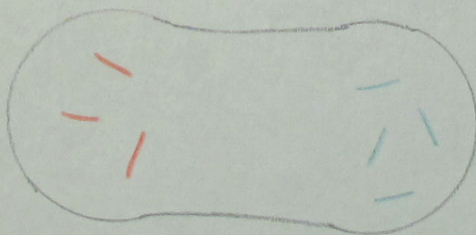
2.



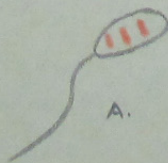
3.



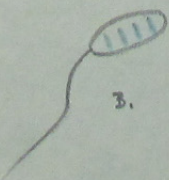
4.



5.



A.

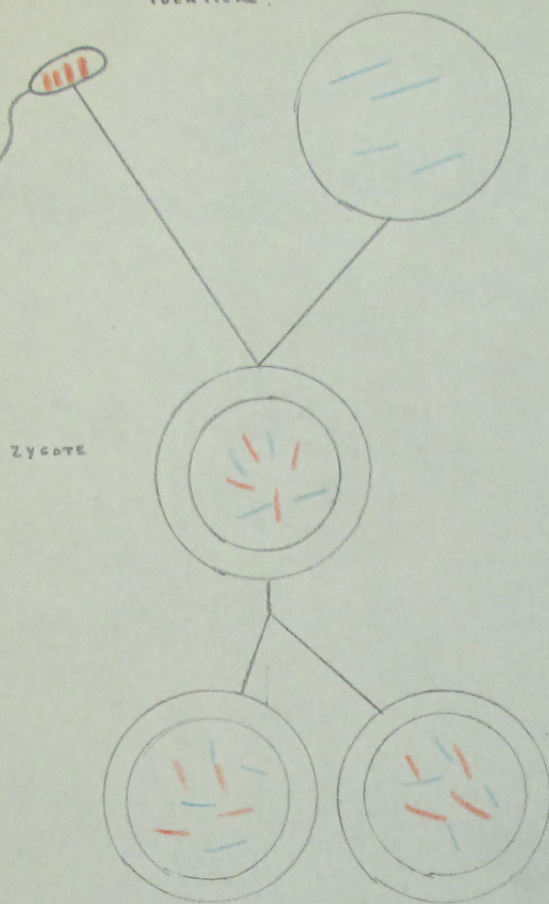


B.

IF A MEETS OVUM IT IS A GIRL.
IF B MEETS OVUM IT IS A BOY.

FORMATION OF TWINS.

IDENTICAL.



CELL SHOULD DIVIDE INTO DAUGHTER CELLS JOINED TOGETHER. IN CASE OF TWINS, CELLS GET SEPARATED.

FRATERNAL.

TWO OVA PRODUCED - BOTH FERTILIZED BY SPERM.

ONTOGENY RECAPITULATES PHYLOGENY.

THE DEVELOPMENT OF THE INDIVIDUAL REPEATS THE DEVELOPMENT OF THE RACE.

1.



2.



MORULA STAGE

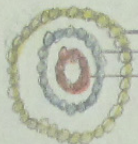
CROSS-SECTION IS TUBULAR.

3.



BLASTULA STAGE

4.



ECTODERM

MESODERM

ENDODERM

Male reproductive system

The sperm are produced in the testes. From there they are collected in the seminiferous tubules, go into the one large tubule or epididymus, thence to a larger tube the vas deferens which terminates in the seminal vesicle. The two s. v. are reservoirs for the seminal fluid, until ejected in sexual excitement.

At that time the semen enters the urethra just below the bladder & just above the base of the penis. It is discharged by muscular contraction of the walls of the sex organs.

Female reproductive system

The ova are produced and contained in the ovary. To leave the ovary they float in a liquid to the tube, and drop into the abdominal cavity, where they are picked up by the fimbriae, long finger-like tenacles on the ends of the Fallopian tubes. From here the ova are propelled along the tube towards the uterus by cilia, small hairs lining the Fallopian tubes. It is in this tube that the sperm meets the ova.

After the zygote has reached the berry stage, after 2 or 3 days, it enters the uterus, where the fetus grows and develops.



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